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## (54) Subscription broadcasting system

(57) A viewer applies to view a particular programme through a public telephone line by a data communication device, a charging center sends a viewing permit code to the data communication device and collects fees for the program. The scrambled programme is broadcast and the viewing permit code enables unscrambling thereof. The application for viewing a program specifies the program by an identification number or the hour of broadcasting.

FIG. 1

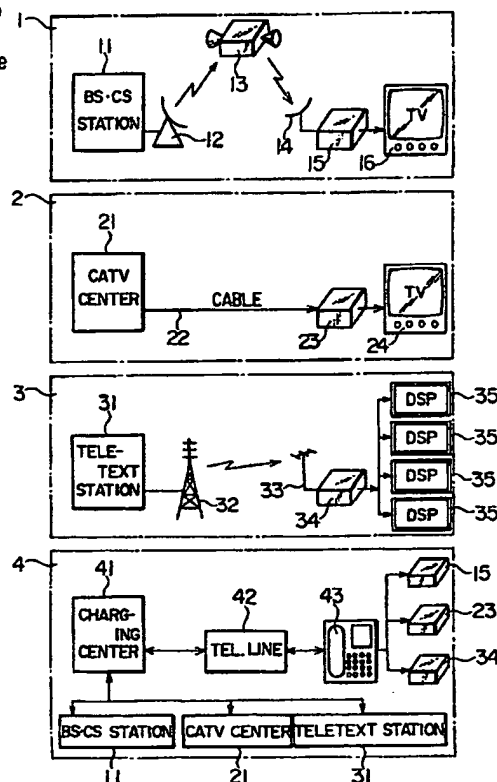
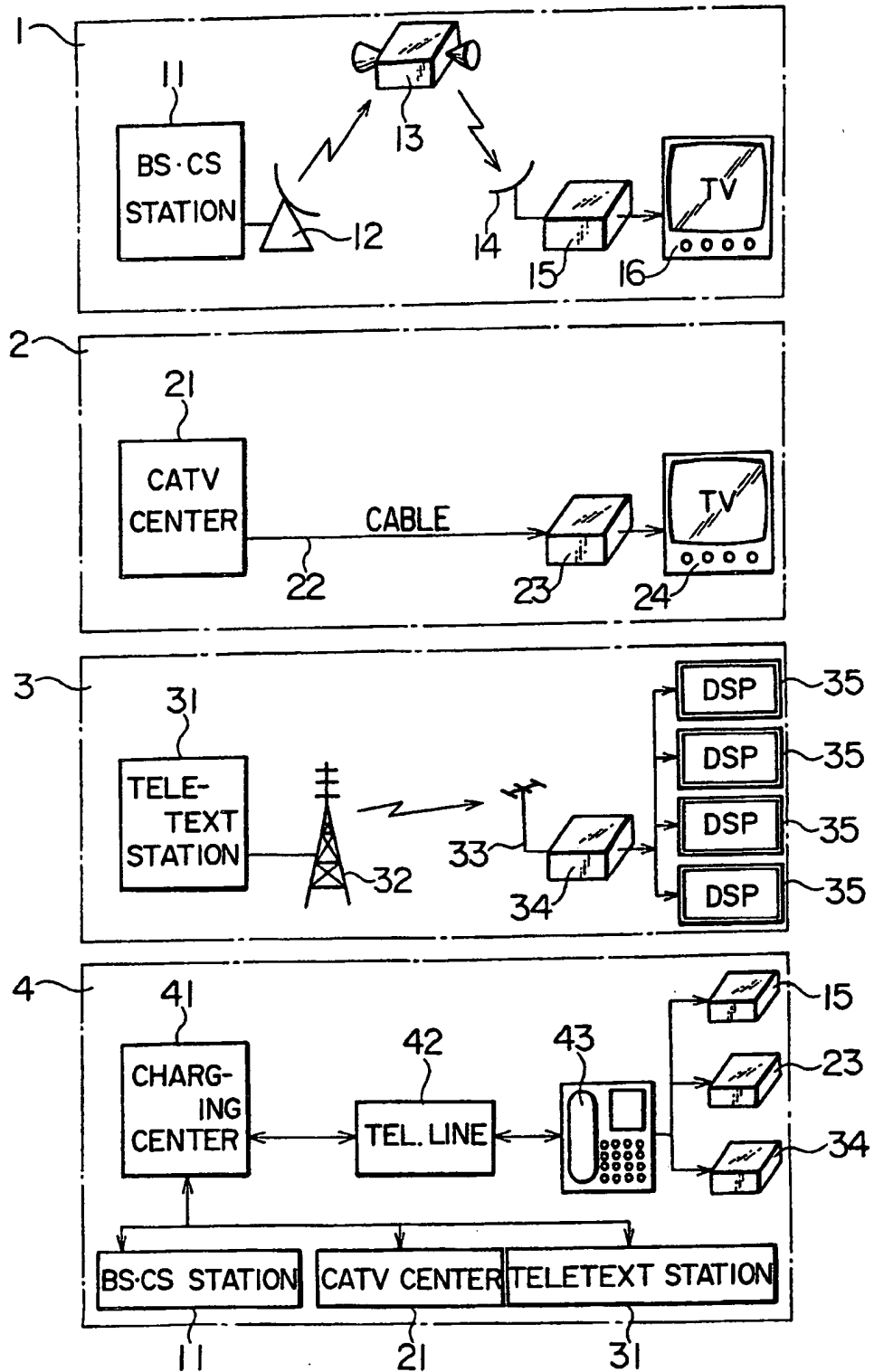


FIG. 1



## SPECIFICATION

TITLE OF THE INVENTION  
BROADCASTING AND COMMUNICATION SYSTEM

## BACKGROUND OF THE INVENTION

The present invention relates to a broadcasting system, in which broadcasting program is offered on pay basis in satellite television broadcasting, cable television broadcasting, or in terrestrial television broadcasting service via broadcasting satellite (BS) or communication satellite (CS).

In the information-oriented society of today, satellite television broadcasting via broadcasting satellite (BS) or communication satellite (CS) as well as cable television broadcasting called CATV (cable television) using coaxial cable or optical fiber cable are increasingly propagated.

Also, multiplex teletext broadcasting for separately transmitting character information via television wave is also being propagated.

In some of these satellite television broadcasting systems, unlike conventional type terrestrial television broadcasting, to which anybody is entitled to have access, a scrambled television program is transmitted so that only the subscribed viewers who signed the viewing contract can view the program and the subscribed viewers receive the program on pay basis using tuner/decoder, which can be descrambled the program.

In order to view the program on such pay satellite television broadcasting, it is necessary to use special-purpose tuner/decoder. The tuner/decoder is provided with ID code, which is transmitted regularly (e.g. once monthly) from satellite, and only the tuner/decoder receiving the transmitted ID code can descramble the program.

For this reason, problems may arise in some cases. For instance,

the television viewers cannot view by contract in some cases, or if they failed to receive ID code from some reasons, it is not possible to view the program even though they have already subscribed for the program.

Because the tuner/decoder is of special-purpose type, many types of tuner/decoders are needed in order to view the programs from many pay satellite television broadcasting systems.

In CATV, which can transmit several tens of channels at the same time, special channels for broadcasting motion pictures, sports programs, music programs, etc. are broadcast in addition to general channels, which are not scrambled and can be viewed by comprehensive contract. The programs of such special television channels are transmitted as scrambled pay television channels. To view the programs in the scrambled channels, it is necessary to sign a contract for descrambling. Because the contract period is normally renewed by about one month, it is not possible to view the programs by contract signed at any desired time.

In order to have access to live sports program, motion picture program or music program to be broadcast through the scrambled satellite television broadcasting or CATV channels, there is a special system, in which a viewing time recorder is installed on each television set, and the fee is to be paid by deferred payment based on the actually viewed programs. However, much labor is required for the control and fee collection for such system.

When a television viewer receives programs from terrestrial or satellite television broadcasting and secondarily distributes them to a number of display devices, general television viewers may have to pay for some of the programs due to copyright even though the programs are offered free of charge from the original broadcasting station.

Typical example of the broadcasting program offered by distribution is multiplex teletext broadcasting. Because valuable information such as news, stock price information, foreign exchange information, traffic

information, information on special events, market information, or subscription information are offered through the multiplex teletext broadcasting, such system is very useful if it is utilized at the places where many people come together. In many cases, multiplex teletext broadcasting is transmitted by terrestrial broadcasting and is not charged. However, in case of the secondary utilization using the system by receiving and distributing a program to a number of display devices, the program is offered on charged basis because copyright is involved.

In this way, if the viewers want to view or distribute the programs from terrestrial television broadcasting or multiplex teletext broadcasting on pay basis, there is no means to sign the subscription contract for individual programs same as in the cases of satellite television broadcasting or CATV, and each viewer must sign subscription contract for each channel, in which the viewer views or distributes desired programs.

#### SUMMARY OF THE INVENTION

To solve the above problems, which are not solved by conventional technique, it is an object of the present invention to provide a broadcasting system, which can actualize the so-called "pay-per-view" for receiving individual program without comprehensive contract on charged basis.

To attain the above object, the broadcasting system according to the present invention is characterized in that a charging center sends a viewing permit code for viewing a pay program to a data communication apparatus in response to an application for viewing the pay program, which is executed from a pay-per-program viewer through a public telephone line by a data communication device and collects fees for such program, and receiving device, when it accepts the viewing permit code, displays television picture on a television set according to the viewing

permit code with a charging system, and also the charging center sends a distribution permit code for distributing a teletext program to the data communication device in response to the application for the teletext program, which is executed from a teletext program distributor by the data communication device through public telephone line and collects fees for the program distribution and a teletext receiving device when it accepts the distribution permit code transmits teletext picture to display devices according to the distribution permit code.

The pay-per-program viewer signs a contract with the charging center through tele-communication line and accepts viewing permit code. By the viewing permit code, the viewer can descramble and view the program.

#### BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 is a broadcasting and communication system according to the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 shows a broadcasting system of the present invention.

The broadcasting system comprises a satellite television broadcasting system 1, a CATV system 2, a multiplex teletext broadcasting system 3 using terrestrial television broadcasting, and a charging system 4.

In the satellite television broadcasting system 1 using BS or CS, reference numeral 11 represents a terrestrial station of satellite television broadcasting, and television wave including a program code and a scrambled television signal is transmitted from a satellite communication transmitting antenna 12 to a geostationary satellite 13 on a geostationary orbit about 30,000 km above the equator.

When the television wave from satellite communication transmitting antenna 12 is received, the geostationary satellite 13 amplifies the

received television wave, converts it to the frequency in the order of 10 GHz, and transmits it to the ground.

The viewer receives the television wave of 10 GHz from the geostationary satellite 13 by a satellite television broadcasting receiving antenna 14, and the wave is converted to the frequency in the order of 1 GHz and is sent to a satellite television broadcasting receiving tuner/decoder 15. The satellite broadcasting receiving tuner/decoder 15 picks up video signal and audio signal from the television wave, sends them directly as video and audio signals to a television set or converts them again to the frequency receivable by the television set.

This satellite broadcasting system itself is the same as a conventional system, while, in this satellite television broadcasting, the program is scrambled, and only the viewers having the viewing permit code for descrambling the program can view the television program.

In CATV system 2, reference numeral 21 represents a CATV broadcasting center, 22 a coaxial cable or an optical fiber cable for transmitting TV signal, and 23 is a CATV adapter/decoder. CATV adapter/decoder 23 picks up video signal and audio signal from CATV signal, descrambles them by decode signal. Further, the signals are sent directly as video and audio signals to the television set or by converting them to the frequency receivable by the television set.

In the multiplex teletext broadcasting system 3, reference numeral 31 is a terrestrial multiplex teletext broadcasting station for transmitting television signal with multiplex teletext on television wave program as terrestrial television wave from a television transmitting antenna 32. The transmitted terrestrial television wave is received by a television wave receiving antenna 33, and multiplex teletext signal is picked up from the television signal by a multiplex teletext adapter 34, and the signal is distributed to display devices 35, 35, 35, ..... such as video monitor, LED (light emitting diode) display device, LCD (liquid

crystal device) display unit, display-phone, personal computer display unit, etc.

On the other hand, the charging system 4 comprises a charging center 41, a public telephone line 42 and a data communication device 43.

In this charging system 4, the pay-per-viewer applies to the charging center 41 through the public telephone line 42 by the data communication device 43 such as display-phone.

Upon receipt of the application from the pay-per-viewer, a viewing permit code for viewing a pay program is sent from the charging center 41 to the data communication device 43.

The viewing permit code sent to the data communication device 43 is sent to a satellite broadcasting tuner/decoder 15, a CATV adapter/decoder 23 or a multiplex teletext adapter 34 by on-line via a parallel data line, serial data line of RS-232C standard or ordinary public telephone line using modem, or by off-line via semiconductor memory unit such as IC card, memory card, etc. or magnetic memory unit such as magnetic card, magnetic disk, etc.

Upon receipt of the viewing permit code, the satellite broadcasting tuner/decoder 15, CATV adapter/decoder 23 or multiplex teletext adapter 34 descrambles the program, to which a program code corresponding to the viewer permit code had been given, and television signal is sent to a television set 16 or 24 or teletext signal is sent to display devices 35, 35, ..... Thus, the viewable picture is displayed on the television set 16 or 24, and character signal is displayed on the display devices 35, 35, 35, .....

On the other hand, the fee for each pay program and the viewing permit code for each pay program are sent in advance from the satellite broadcasting terrestrial station 11, CATV center 21 or the terrestrial wave broadcasting station 31 to the charging center 41. The charging center sends the viewing permit code to the viewers, who had applied for



viewing, and collects the fee on behalf of the satellite broadcasting terrestrial station 11, CATV center 21 or the terrestrial wave broadcasting station 31.

By this method, it is difficult to decode the scramble code and the viewers applied can view the pay program even when the broadcasting time has been changed.

For satisfactory execution of the pay-per-view system, different program code is set for each program in the above embodiment, and the viewing permit code is given for each program. This method is very reliable, but application procedure is complicated in case a viewer wants to watch non-regular program, i.e. serial programs which are broadcast on specific day, week or month or at the same hour every day.

To solve this problem, the program code should contain the data for month, week, day, etc., and the viewing permit code should also contain the data such as month, week, day, etc.

Also, a plurality of scramble patterns should be prepared and the program code should contain scramble pattern code. The viewing permit code also contains scramble pattern code information so that descrambling is achievable only when these codes are met. Thus, it is practically impossible to descramble the codes by the outsiders.

The safety and the security of the scramble code is further ensured if the coding method disclosed in Japanese Patent Application No. 4-164380, applied previously by the applicant of the present application, is used as means for preparing the scramble code.

In addition to the combination of the program code and the viewing permit code as explained in the above embodiment, there is another descrambling method, in which the same code is used as descramble code at all times and the descramble code is made valid for the hour corresponding to the time when the program is broadcast. This is a very simple method, but the subscribed viewer may not be able to view the

program in case the broadcasting time of the program has been changed. Also, because the same scramble code is used at all times, it may be relatively easy to decode the scramble code.

There is a more convenient method, in which the charging center sets an amount to the pay-per-program viewer by means of prepaid card so that the viewers can view the program within the amount of such fee.

As the collecting system available for the charging center, there are payment collection service by public telephone and telegram common carrier, payment collection by VAN service, payment collection service by banks, etc.

In the above embodiment, display-phone is used as the data communication device 43, where as it is also possible to use a telephone set available for data communication such as push-button telephone, portable telephone, etc. or to use the devices such as personal computer, word-processor, etc. with modem as data communication device.

In particular, it is possible to install a portable telephone set on an automobile to control television set or multiplex teletext receiver set mounted on the automobile.

In the above embodiment, description has been given on the charging system for television broadcasting, while this system is also applicable for the other communication means for charging fee on each program, e.g. broadcasting and communication means using satellite such as audio broadcasting, data broadcasting, data communication, etc. or various types of broadcasting and communication means using terrestrial waves such as data broadcasting and data communication such as audio broadcasting or FM multiplex broadcasting.

In applying for program viewing, it is more convenient if program code system recently used in video recording is utilized.

In the above method, in which program code is contained in the program to be broadcast, more reliable VTR recording or television

receiving can be ensured if the program code is monitored on the receiving side and video recording or TV picture receiving is controlled by the program code.

As it is evident from the above description, it is possible according to the charging system of the present invention to execute the so-called "pay-per-view" for receiving pay program without signing comprehensive contract, as not achievable by conventional technique, and to collect the fee reliably without additional labor compared with the conventional method.

WHAT WE CLAIM ARE:

1. A pay broadcasting system, comprising a broadcasting station and a charging center:

said broadcasting station broadcasts a program number to identify a program to be broadcast together with a scrambled broadcasting program;

said charging center sends a viewing permit code for viewing a pay program in response to an application for program viewing applied through public telephone line by a data communication device and also collects fees for such program; and

a receiving device accepting said viewing permit code descrambles the program received according to said viewing permit code.

2. A broadcasting system according to Claim 1, wherein scramble pattern is fixed.

3. A broadcasting system according to Claim 1, wherein there are a plurality of scramble patterns.

4. A broadcasting system according to Claim 1, wherein an application for viewing a program is made by specifying the program to be broadcast.

5. A broadcasting system according to Claim 1, wherein the application for viewing a program is made by specifying the hour of broadcasting.

6. A broadcasting system according to Claim 1, wherein the viewing permit code is a descramble code.

7. A broadcasting system according to Claim 1, wherein said pay program is a video program.

8. A broadcasting system according to Claim 1, wherein said pay program is an audio program.

9. A broadcasting system according to Claim 1, wherein said pay program is a data program.

10. A broadcasting system, comprising a broadcasting station and

a charging center:

said broadcasting station broadcasts a program number to identify the program to be broadcast together with the broadcasting program;

said charging center sends a distribution permit code for distributing a broadcasting program in response to an application for program distribution applied through public telephone line by a data communication device and also collects fees for said program; and

a distributor receiving said distribution permit code distributes said broadcasting program received according to said distribution permit code.

11. A broadcasting system according to Claim 10, wherein scramble pattern is fixed.

12. A broadcasting system according to Claim 10, wherein there are a plurality of scramble patterns.

13. A broadcasting system according to Claim 10, wherein said application for distributing program is made by specifying the program to be broadcast.

14. A broadcasting system according to Claim 10, wherein said application for distributing program is made by specifying the hour of broadcasting.

15. A broadcasting system according to Claim 10, wherein said viewing permit code is a descramble code.

16. A broadcasting system according to Claim 10, wherein said pay program is a video program.

17. A broadcasting system according to Claim 10, wherein said pay program is an audio program.

18. A broadcasting system according to Claim 10, wherein said pay program is a data program.

19. A communication broadcasting system, comprising a communication broadcasting station and a charging center:

said communication broadcasting station transmits a program number to identify the communication program together with a scrambled communication program;

said charging center sends a viewing permit code for viewing a pay program in response to an application for viewing said communication broadcasting applied through public telephone line by a data communication device, and also collects fees for such program; and

a receiving device accepting said viewing permit code descrambles the communication broadcasting program received according to said viewing permit code.

20. A communication broadcasting system according to Claim 19, wherein scramble pattern is fixed.

21. A communication broadcasting system according to Claim 19, wherein there are a plurality of scramble patterns.

22. A communication broadcasting system according to Claim 19, wherein an application for viewing program is made by specifying said communication program.

23. A communication broadcasting system according to Claim 19, wherein the application for viewing program is made by specifying the time of communication.

24. A communication broadcasting system according to Claim 19, wherein said viewing permit code is a descramble code.

25. A communication broadcasting system according to Claim 19, wherein said pay program is a video program.

26. A communication broadcasting system according to Claim 19, wherein said pay program is an audio program.

27. A communication broadcasting system according to Claim 19, wherein said pay program is a data program.

28. A communication broadcasting system, comprising a communication broadcasting station and a charging center:

said communication broadcasting station transmits a program number to identify a communication broadcasting program together with a communication program;

said charging center sends a distribution permit code for distributing a communication broadcasting program in response to an application for distributing program applied through public telephone line by a data communication device, and collects fees for the program; and

a distributing device accepting said distribution permit code distributes a received communication broadcasting program according to said distribution permit code.

29. A communication broadcasting system according to Claim 28, wherein scramble pattern is fixed.

30. A communication broadcasting system according to Claim 28, wherein there are a plurality of scramble patterns.

31. A communication broadcasting system according to Claim 28, wherein an application for distributing program is applied by specifying said communication broadcasting program.

32. A communication broadcasting system according to Claim 28, wherein an application for distributing program is applied by specifying the hour of communication broadcasting.

33. A communication broadcasting system according to Claim 28, wherein said distribution permit code is a descramble code.

34. A communication broadcasting system according to Claim 28, wherein said communication broadcasting program is a video program.

35. A communication broadcasting system according to Claim 28, wherein said communication broadcasting program is an audio program.

36. A communication broadcasting system according to Claim 28, wherein said communication broadcasting program is a data program.

37. A receiving device, comprising a tuner for picking up a

scrambled signal from broadcasting wave, and a scramble decoder for descrambling said scramble signal by a scramble decode signal supplied from means other than broadcasting wave.

38. A receiving device according to Claim 37, wherein said supplied scramble decode signal is supplied on on-line basis.

39. A receiving device according to Claim 37, wherein said supplied scramble decode signal is supplied on off-line basis.

40. A broadcasting system, comprising a broadcasting transmitter and a receiver:

said broadcasting transmitter transmits a program number to identify a broadcasting program together with said broadcasting program; and

said receiver monitors said program number and controls the receiving by said program number.

41. A receiving device for monitoring a program number to be transmitted together with a broadcasting program transmitted by a broadcasting transmitter and for controlling the receiving by said program number.

42. A receiving device according to Claim 41, wherein said receiving device is a television set.

43. A receiving device according to Claim 41, wherein said receiving device is a video recorder.

44. A pay broadcasting system substantially as herein described with reference to and as shown in the accompanying drawings.



- 15 -

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

Application number  
 GB 9314848.4

**Relevant Technical Fields**

(i) UK Cl (Ed.L)      H4F (DE) H4R (RCSC, RCSS, RCST, RPTS)

(ii) Int Cl (Ed.5)      H04N 7/173

Search Examiner  
 N W HALL

Date of completion of Search  
 4 OCTOBER 1993

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ON-LINE: WPI

Documents considered relevant following a search in respect of Claims :-  
 1-44

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**&:** Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	WO 85/03830 A1 (ATT) Whole document	37 at least
X	WO 80/00209 A1 (TELEASE) Whole document	40, 49 at least
X	US 4916737 (CHOMET) Whole document	37 at least

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